Cargill Salt

Watkins Glen Plant
518 East 4th Street
Watkins Glen, NY 14891

June 9, 2003

Dermott Courtney
Underground Injection Control Section
U. S. Environmental Protection Agency Region 2
290 Broadway
New York, New York 10007-1866

Ref: UIC Permit NYU105431

Dear Mr. Courtney:

Water-brine interface tests were performed on Wells 19, 20, and 21 to demonstrate mechanical integrity in compliance with the subject permit. The tests of Wells 19 and 21 were successful and the wells have been returned to service. The master gate valve on Well 20 had a small packing leak that could not be repaired with pressure on the well; this leak caused a great enough pressure loss during the test period to prevent a successful test. We have removed the well from service until the gallery can be depressurized and the valve replaced. We will notify your office when we are able to schedule another MIT. In the meantime, the wellbore will be kept full of water and any leakage from the valve packing will be contained in the concrete well vault, periodically collected, and injected into the active solution mining wells.

If you have any questions, please call me at 970-875-0124, or email to mike_schumacher@cargill.com.

Sincerely,

Michael J. Schumacher
Solution Mining Manager

enclosures

cc: G. Meyer
R. Nemecek, NYSDEC

CARGILL INCORPORATED
WATER-BRINE INTERFACE
MECHANICAL INTEGRITY TEST REPORT

Address

Cargill Salt
Watkins Glen Plant
518 E. 4th Street
Watkins Glen , New York 14891
(607) 535-6300

General Information

UIC Permit	NYU105431
Field	**Watkins Glen**
Test well	**21**
Reference well	**24**
Other wells in gallery	**19,20,22,23**
Test well location	**Lat. 42°-23'-05", Long. 76°-51'-46"**
	Watkins Glen, New York
API No.	**31-097-21472**
Test Date	**06-Jun-03**
Test fluid	**Water**
Result	**PASSED TEST**

Test well data

Well no.	21		
Depth of surface casing	948	ft.	**Drilling record**
Depth to top of salt formation	1758	ft.	**12/92 Neutron log**
Depth to top of cavern	2254	ft.	**10/01 Gamma ray log**
Depth of production casing	2511	ft.	**9/96 Sonar caliper**
Depth of tubing (if present)	none	ft.	
Total depth	2573	ft.	**9/96 Sonar caliper**
Original total depth	2675	ft.	**Drilling record**
Outer diameter of production casing	7	in.	**Drilling record**
Outer diameter of tubing (if present)	none	in.	
Capacity of casing or annulus	1.607	gpf	
Volume of casing or annulus	4035	gals.	
Normal operating pressure	60	psig	
Mode of last 24 hours of operation	**Water Injection**		

All depths referenced to wellhead , elev. 447

Reference well data

Well no.	24		
Depth of surface casing	812	ft.	**Drilling record**
Depth to top of salt formation	1782	ft.	**9/96 Gamma ray log**
Depth to top of cavern	2503	ft.	**9/98 Gamma ray log**
Depth of production casing	2580	ft.	**Drilling record**
Depth of tubing (if present)	none	ft.	
Total depth	2580	ft.	**6/97 Gamma ray log**
Original total depth	2615	ft.	**Drilling record**
Outer diameter of production casing	7	in.	**Drilling record**
Outer diameter of tubing (if present)	none	in.	
Capacity of casing or tubing	1.607	gpf	
Volume of casing or tubing	4146	gals.	

All depths referenced to wellhead , elev. 445
Casing is perforated at 2550'

Target Depth for Interface

Normally 50 feet above the end of the casing or the cavern roof, whichever is shallower

Depth **2204** ft.

Instrumentation

Well	Test	Reference
Manufacturer	**Paroscientific**	**Paroscientific**
Model	**760-900A**	**760-1K**
Serial No.	**42583**	**42953**
Accuracy	**0.01%**	**0.01%**
Precision	**0.001 psi**	**0.001 psi**

Preparation

If the casing of the test well was most recently used for brine production, flush with water to remove any crystallized salt.

Date and time test well was flushed **not flushed**

Approximate volume in gallons

Shut-in period with water in casing

Comments

Second date and time well was flushed

Approximate volume in gallons

Shut-in period with water in casing

Comments

The test well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the casing or annulus.

Date test well was bled back **06/03/03**

Approximate volume in gallons **10,000**

Specific gravity of fluid **1.178**

Comments A slip blind was placed in the surface piping after the well was bled back to prevent leakage out of the wellhead.

The reference well must be bled back to ensure that it is filled with a fluid of uniform density. Bleed back at least the volume of the tubing or casing.

Date and time ref well was bled back **06/03/03**

Approximate volume in gallons **20,000** gals

Specific gravity of fluid **1.199**

Comments

Set Interface

Test fluid	**Water**
Specific gravity of test fluid	**1.000**
Specific gravity of brine	**1.178**

Calculate maximum permissible injection rate and target pressure differential.

Capacity of casing or annulus		Allowable velocity		Maximum inj. rate
1.607 gpf	x	20 fpm	=	**32** gpm

Target interface depth x gradient diff. = target pressure diff.

2204 ft. x (1.178 - 1.000) X 0.433 = 169.9 psi

Date	**06/04/03**				change
	Time	Test Well	Ref. Well	Diff.	in diff.
Pressures before injection	**09:14**	**93.635**	**65.780**	**27.855**	
Pressures during injection	**12:11**	**223.597**	**64.721**	**158.876**	**131.021**
Pressures during injection					
Pressures after injection	**13:14**	**266.171**	**65.529**	**200.642**	**172.787**

All pressures measured in psia

Calculated final interface depth

172.787 psi / ((1.178 - 1.000) X 0.433) = 2242 ft.

Note : Volume of injected fluid was not measured.

Temperature Stabilization Period

	Date	Time	Test Well	Ref. Well	Diff.	change in diff.
Start Stabilization	**06/04**	**13:14**	**266.171**	**65.529**	**200.642**	
Inter. press	**06/05**	**10:02**	**277.044**	**75.987**	**201.057**	**0.415**
Inter. press	**06/05**	**13:35**	**279.058**	**78.101**	**200.957**	**0.315**
Start of test	**06/06**	**11:25**	**289.239**	**89.047**	**200.192**	**-0.450**
Total time		**46** hrs.				

(Minimum time is 36 hours.)

The observed change in differential pressure does not indicate significant interface movement during this period.

Test Period

	Date	Time	Test Well	Ref. Well	Diff.	change in diff.
Start of test	**06/06**	**11:25**	**289.239**	**89.047**	**200.192**	
Inter. press	**06/06**	**14:00**	**290.229**	**90.011**	**200.218**	**0.026**
Inter. press	**06/06**	**15:25**	**290.574**	**90.413**	**200.161**	**-0.031**
Inter. press	**06/06**	**17:25**	**291.048**	**90.971**	**200.077**	**-0.115**
End test	**06/06**	**19:25**	**291.894**	**91.912**	**199.982**	**-0.210**

Test Period	**8**	hrs
Average pressure change	**-0.026**	psi/hr

Maximum allowable pressure change is 0.05 psi/hr over 8 hours.

If the test was conducted in accordance with the method approved in the USEPA notice published in the Federal Register of August 18,1989, page 34169-34171 (as amended in Federal Register of November 14, 1989, page 47451) and the rate of pressure change during the test period was less than 0.05 psi/hour, the well has passed the test and demonstrated internal mechanical integrity.

Result : **PASSED TEST**

Comments

Test and reference well pressures were read simultaneously during the eight-hour test period.

Person conducting test:

Michael J. Schumacher
Solution mining manager
Cargill Salt
916 S. Riverside Ave.
St. Clair, MI 48079
(970)875-0124

Witnessing field personnel: **None**

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for the submission of false information, including the possibility of fine and imprisonment for knowing violations.

Signature of owner/authorized agent : _____

Michael J. Schumacher
Solution mining manager
Cargill Salt
916 S. Riverside Ave.
St. Clair, MI 48079
(970)875-0124

Attachments :

Field data sheets (1)
Gauge calibration certificates

FIELD DATA SHEET

TEST WELL 21

REFERENCE WELL 24

INSTRUMENT S/N 42953/42583

INSTRUMENT S/N 42583/42953

DATE	TIME	TEST PRESS.	REF PRESS.	DIFFERENCE	OPER. INIT.	REMARKS
6/4/03	9:14	93.635	65.7804	27.855	MH	
	9:15					START PUMPING
	12:11	223.597	64.7214	158.876	MH	FLOWING
	13:14	266.171	65.5293	200.642	MH	STATIC - PUMPING COMPLETE
6/5	10:02	277.044	75.9871	201.057	MH	TEMP STABILIZATION
	13:35	279.058	78.1005	200.957	MH	
6/6	SWAPPED INSTRUMENTS					
	11:25	289.239	89.0471	200.192	MH	START TEST
	13:25	290.063	DATA LOGGED FAILED		MH	
	14:00	290.229	90.0114	200.218	MH	
	15:25	290.574	90.4127	200.161	MH	
	17:25	291.048	90.9710	200.077	MH	
	19:25	291.894	91.9118	199.982	MH	COMPLETE